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Department of Natural Resources, Mineral Resources Branch

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Comments or questions? Please contact:

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NOVA SCOTIA
Natural Resources

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Mining Matters Conference Builds on Recent Success

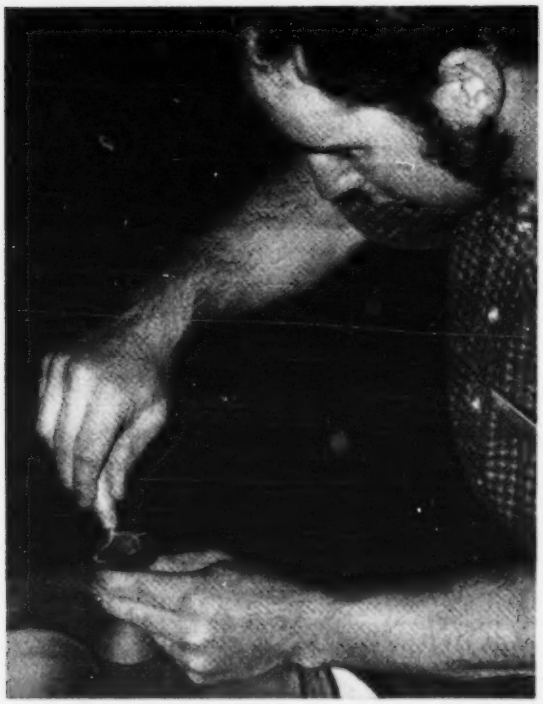
On November 13 and 14, 2002, the Department of Natural Resources will host its annual **Mining Matters for Nova Scotia** conference at the Westin Nova Scotian hotel in Halifax. Last year's event featured very successful 25th Anniversary celebrations and will be a hard act to follow. However, organizers are labouring to build on the success of the 2001 conference.

Technical sessions, displays and special events are designed to address the four main objectives of Mining Matters, which include: (1) to increase awareness and understanding of mining and mineral resources in both the public and private sectors; (2) to promote the profile of mining to various government agencies involved in economic development; (3) to serve as a focal point for the local mining industry; and (4) to provide a forum for government and university geoscience research.

Accordingly, this year's technical sessions have been organized into three theme sessions. On the morning of November 13 a session entitled *Current Developments in Nova Scotia's Mining Industry* will be hosted by the Mining Society of Nova Scotia and will, as the name indicates, focus on some of the more interesting new mineral development highlights. The first day's afternoon session is entitled *Geoscience in Our Daily Lives* and will feature presentations on a variety of topics such as mercury in geological materials, finding aggregate resources for new developments, and innovative reclamation techniques to enhance local communities. A morning session on November 14 entitled *Current Geoscience Research in Nova Scotia* will feature results from the federal-provincial Targeted Geoscience Initiative project (TGI) in southern Cape Breton and northeastern mainland Nova Scotia. Presentations from local universities will also form part of this session.

Displays in Commonwealth Ballroom A will feature local mineral-producing companies, supply and service companies, prospectors and exploration companies with exciting mineral projects, as well as geoscience research currently underway at DNR, Natural Resources Canada, and local universities. Plans are underway to have a

Gold panning demonstrations always draw a crowd.



(Left) Cape Breton artist Ezra Morrell works with Cape Breton clay at Mining Matters 2001. The clay deposit was discovered by DNR geologists Ralph Stea and Terry Goodwin during field work as part of the federal-provincial Targeted Geoscience Initiative project in south-central Cape Breton Island. Below is a photograph of some of the clay pots created by Ezra during last year's conference. The pots were later kiln-dried and glazed. Some of them are still on display at the DNR library in Halifax.

stone carver come to the conference and work on a sculpture from a block of red marble from the MacLeod Resources' operation in Big Kennedy Brook, near River Denys, Inverness County. MacLeod has extracted some blocks of marble from its site in central Cape Breton Island for test processing, and it will be very exciting to see what an artist can create with this beautiful stone.

One of the most popular aspects of Mining Matters is the annual field trip. This year's outing will feature aspects of geology and mineral development in the Halifax Regional Municipality and will be led by Howard Donohoe and Fred Bonner. Details of the trip are outlined on page 8.

Mike MacDonald

Introducing the Mineral Resources Branch

Formation of the province's new Department of Energy has resulted in some changes to the Department of Natural Resources. One of the key groups included in the new department is the Energy Utilization Section, headed by Allan Parker, which was formerly part of the Minerals and Energy Branch. The movement of the Energy Utilization Section out of DNR provided an opportunity to consider name changes in some of our organizational units, to better reflect our current responsibilities and practices. Following considerable internal discussion, name changes were proposed and approved as follows:

- The name of the "Minerals and Energy Branch" (Scott Swinden, Executive Director) has been changed to "Mineral Resources Branch" to better reflect the branch's focus on mineral resource management responsibilities. We interpret "mineral" in this context to reflect the entire range of geological resources that we deal with: not just those that may eventually be mined, but also those resources that we deal with as part of our other responsibilities, such as geotechnical matters, tourism, environmental management, health and safety.
- The name of the "Mineral and Energy Resources Division" (Mike Cherry, Director) has been changed to "Geological Services Division". We believe this more accurately reflects the geological focus of this division, and emphasizes the fact that it provides services that can be used by a wide variety of government clients, as well as the private sector and the public.
- The name of the "Mineral Resource Evaluation Section" (Bob Ryan, Manager) has been changed to "Resource Evaluation Section" to better reflect the wide range of geological resources (e.g. fossils, hydrocarbons, aggregates) that are addressed by this group above and beyond minerals.

These name changes are now in effect, as you may have noticed on the newsletter's masthead. They did not involve any movement of staff or other organizational changes.

Scott Swinden

From the Mineral Inventory Files

Gold in the Cape Breton Highlands: Inco Gold or Inca Gold?

During the mid- to late-1980s numerous occurrences of native gold were discovered in the central Cape Breton Highlands (Fig. 1). These discoveries piqued the interest of the local exploration community, and they became known simply as the Inco Gold Showings. In reality, they were discovered by Scominex in 1986 and explored under a joint effort by Inco Exploration, Technical Services Inc., and Scominex (Inco-Scominex). It all started with reconnaissance stream sediment surveys that indicated the Indian Brook watershed was gold positive. Follow-up prospecting quickly turned up quartz-hematite boulders with ore grade native gold along logging roads west of McMillan Flowage (Fig. 1). Subsequent trenching and diamond-drilling revealed quartz-hematite veins at what became known as the "Main Zone". One vein there returned 26.5 g Au/t over 0.67 m for a strike length of 70 m.

Numerous other auriferous boulders were discovered in the region. In almost all cases, the boulders were essentially "in place" with their source veins located directly beneath them. A study of the surficial geology of the property revealed that only very restricted pockets of glacial till are present and that much of the overburden draping the region is actually regolith, or *in situ* soil developed directly on pre-Ice Age bedrock. In other words, there has been little or no glacial transport.

The property is underlain by a mixed gneissic and amphibolitic terrain of Precambrian to lower Paleozoic age, intruded some 560 million years ago by the mostly dioritic, but locally granodioritic and granitic, Kathy Road Pluton. It became quickly apparent during exploration that the auriferous quartz veins are not restricted to any particular rock type: occurrences were found in essentially every rock unit on the property. Native gold was found in pyrite- and galena-bearing quartz veins out, in general, the highest grade gold is associated with veins containing abundant hematite. Wall rocks adjacent to the veins have undergone a variety of hydrothermal alterations including epidote, sericite, chlorite, argillic, carbonate, tourmaline and hematite alteration. The alteration zones are commonly enriched in gold.

The fact that the development of hematite in the veins is the most important feature associated with ore-grade Au levels means that understanding the timing and origin of this process is key. Some believe that development of the hematite was related to Pleistocene surficial weathering (under sub-Arctic conditions) of a pre-existing gold-bearing, but sub-economic, vein system. Examples of mobilization and redistribution of native gold under these conditions are known elsewhere.

Gold occurs in four styles at the Inco Showings: (1) within colloidal hematite; (2) within hematite replacing pyrite cubes; (3) as inclusions within pyrite; and (4) as inclusions and fracture fillings in galena. Electron microprobe analysis of gold grains from these styles has shown that they consist essentially of gold and silver, with gold contents ranging from 78 to 97 wt. %. Most importantly, the Au grains occurring in hematite replacing pyrite, and in colloidal hematite, displayed a wide variation of Au content but were generally the more Ag-rich grains. I consider this important as these two styles of mineralization are most consistent with crystallization under sub-Arctic weathering conditions. However, published studies have shown that gold formed under sub-Arctic weathering conditions occurs as relatively pure gold that is low in silver. This is the exact opposite of what is observed in the Inco Showings and is a strong suggestion that hematite alteration was probably of hydrothermal origin.

G. A. O'Reilly

Note: The title does not reflect any connection to the Incas of South America. It simply reflects the unknown age (ancient vs. Pleistocene) of gold deposition.

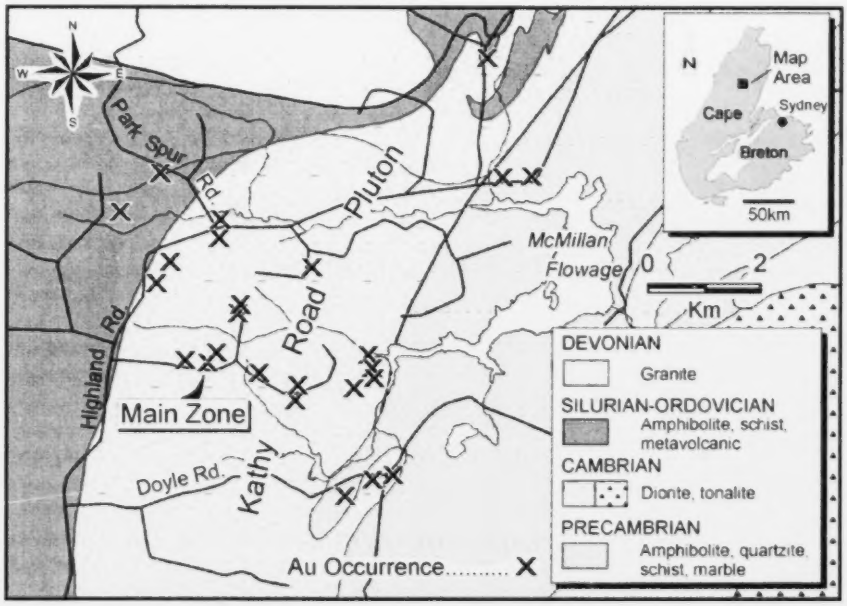


***Fig. 1**. Geology of the McMillan Flowage area showing locations of the Inco Au Showings.*

Mining Matters for Nova Scotia 2002:

Wednesday, November 13, 2002

8:30 am - 7:00 pm - Registration (Commonwealth Foyer)

8:30 am - 9:00 am - Coffee and refreshments (in Commonwealth B)

9:00 am - 9:20 am - Fall business meeting of the Mining Society of Nova Scotia (MSNS) in Commonwealth B

10:00 am - 9:00 pm - Displays open (Commonwealth A)

9:20 am - 9:30 am - Welcoming remarks (Dan Graham, Deputy Minister of Natural Resources)
Note: All talks will be presented in Commonwealth Room B

Session 1 - Current Developments in Nova Scotia's Mining Industry (hosted by the Mining Society of Nova Scotia)

Session Chair: Allan Davidson, President, MSNS

9:30 am - 10:00 am
Mike MacDonald, DNR: Exploration and development highlights in Nova Scotia

10:00 am - 10:30 am
Buck Wile, Canadian Salt Company: Salt: a mineral that really matters

10:30 am - 10:45 am
Refreshment break

10:45 am - 11:15 am
Paul Frempong, Dalhousie University: Handling outliers for resource estimation in gold deposits

11:15 am - 11:45 am
Kirk Hillman and Cyril MacDonald, Fundy Gypsum Company: Hantsport upgrade

11:45 am - 1:05 pm
Lunch break (no scheduled event)

Session 2 - Geoscience in our Daily Lives

Session Chair: Mike Cherry, DNR

1:05 pm - 1:10 pm
Mike Cherry: Opening remarks

1:10 pm - 1:30 pm
Hon. Cecil P. Clarke, Minister of the Nova Scotia Office of Economic Development

1:30 pm - 2:00 pm
Garth Prime, DNR: Aggregate in the Halifax Regional Municipality: examination of a resource facing an uncertain future

2:00 pm - 2:30 pm
Terry Goodwin and Paul Smith, DNR: Mercury in Nova Scotia: you can run but you can't hide

2:30 pm - 3:00 pm
Refreshment break

3:00 pm - 3:30 pm
Bob Taylor, Natural Resources Canada (GSC Atlantic): Where's the beach, eh?

3:30 pm - 4:00 pm
Jack MacDonald and Paul Harvey, Nova Scotia Department of Energy: Onshore oil and gas exploration in Nova Scotia

4:00 pm - 5:00 pm
Speaker TBA: **Keynote address**

Opportunities for Economic Development

5:00 pm - 9:00 pm
Beer and Beef-on-a-bun Reception, hosted by the Hon. T. A. (Tim) Olive, Minister of Natural Resources, Cost $10

Thursday, November 14

8:30 am - 12:30 pm - Registration

8:30 am - 4:00 pm - Displays open (Commonwealth A)

8:30 am - 9:05 am - Coffee and refreshments

Session 3 - Current Geoscience Research in Nova Scotia

Session Chair: Mike Cherry

9:05 am - 9:15 am
Mike Cherry, DNR: Opening remarks

9:15 am - 9:45 am
Martin Gibling, Michael Rygel and Howard Falcon-Lang, Dalhousie University: Joggins: Carboniferous river and forest assemblages

9:45 am - 10:15 am
Ian Spooner, Acadia University: Holocene climate change in Nova Scotia: past perspectives, future predictions

10:15 am - 10:45 am
Peter Giles, Natural Resources Canada (GSC Atlantic), and Rob Naylor, DNR: Carboniferous stratigraphy of southwestern Cape Breton Island

10:45 am - 11:00 am
Refreshment break

11:00 am - 11:30 am
Ralph Stea, DNR, Mary Feetham and Sue Pullan, Natural Resources Canada (Ottawa): Surficial maps and stratigraphic models for southwest Cape Breton: blueprints for sustainable development

10:30 am - 12:00 pm
Chris White, DNR, Sandra Barr and Steve King, Acadia University, John Ketchum, Royal Ontario Museum, and Peter Reynolds, Dalhousie University: Composition, age, tectonic significance, and economic potential of pre-Carboniferous basement blocks in the Targeted Geoscience Initiative area

12:00 pm - 1:00 pm
Lunch break (no event scheduled)

1:00 pm - 4:00 pm
Displays open

4:00 pm
Conference closed

Friday, November 15

8:00 am - 5:00 pm
Field Trip: Exploring Geoscience, Land-use Planning, and Mineral Development in the Halifax Regional Municipality
Cost $10, for more information see page 8

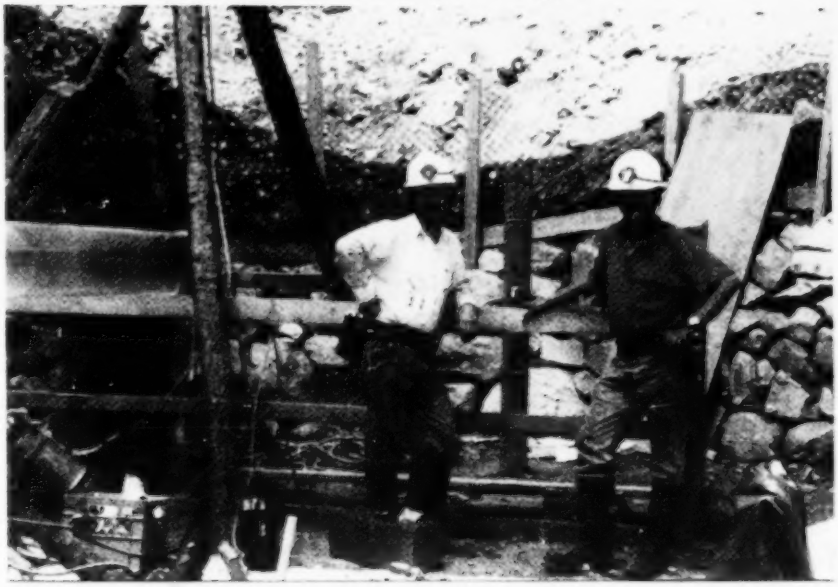
July-September Open Assessment Reports

Report Number	Claim Ref. Map	Licensee
AR ME 11E/08D40-B-19(02)	11E/09A	Amax Minerals Exploration
AR ME 11F/10C 42-O-21(04)	11F/10C	Domtar Limited
AR ME 11F/11C 42-J-68(08)	11F/11C	North Canadian Oils Limited
AR ME 11F/11C 42-J-68(09)	11F/11C	North Canadian Oils Limited
AR ME 11F/12C 39-B-25(02)	11F/12C	Bras d'Or Oil Company Limited
AR ME 11F/14B 42-J-80(03)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(04)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(05)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(06)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(07)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(08)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(09)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(10)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(11)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(12)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(13)	11F/14B	Domtar Limited
AR ME 11F/14B 42-J-80(14)	11F/14B	Domtar Limited
AR ME 11F/15A 48-O-61(14)	11F/15A	Kaiser Celestite Mining Limited
AR ME 11F/16B 27-C-83(26)	11F/16B	Mine Waste Reclamation Limited
AR ME 11F/16B 27-C-83(27)	11F/15A, 16B	Jacques, Whitford and Associates Limited
AR ME 11K/01B 13-C-39(02)	11K/01C	Cerro Mining Company of Canada Limited
AR ME 1914-1	11F/14C	Nova Scotia Steel and Coal Company Limited
AR ME 1969-3	11F/12C	Novasel Limited
AR ME 1969-4	11E/08C	Nova Scotia Department of Mines
AR ME 1977-5	11D/15C	TMF Mineral Resources Limited
AR ME 1977-6	11F/15A	Scotia Limestone Limited
AR ME 1979-10	11F/15A	Scotia Limestone Limited
AR ME 1982-45	11E/01D	Northumberland Mines Limited
AR ME 1982-46	11E/01A, D	Northumberland Mines Limited
AR ME 1982-47	11E/01D	Northumberland Mines Limited
AR ME 1982-48	11E/01D	Northumberland Mines Limited
AR ME 1982-49	11E/01D	Northumberland Mines Limited
AR ME 1982-50	11E/01D	Northumberland Mines Limited
AR ME 1983-21	11E/01D	Northumberland Mines Limited
AR ME 1983-22	11E/01D	Northumberland Mines Limited
AR ME 1995-146	11K/10B	Highland Range Minerals Limited
AR ME 1997-139	11E/10A	REI Nova Scotia Incorporated
AR ME 1997-140	21H/09C	REI Nova Scotia Incorporated
AR ME 1997-141	21H/09D	REI Nova Scotia Incorporated
AR ME 1997-142	21H/09C	REI Nova Scotia Incorporated
AR ME 1997-143	21H/09D	REI Nova Scotia Incorporated
AR ME 1997-144	11E/10A	REI Nova Scotia Incorporated
AR ME 1997-145	11E/10A	REI Nova Scotia Incorporated
AR ME 2000-61	11F/04D	Gold'n Crystal Minerals
AR ME 2000-63	11K/07A, D	Fraser, C J
AR ME 2000-65	11F/11A, B	Statia Terminals Canada Incorporated
AR ME 2000-66	11E/08D	Ross, J D
AR ME 2000-70	11F/04D	Golden Ace Mineral Explorations Limited
AR ME 2001-29	11D/12D	Marchant, R L
PR ME 1951-1	11E/10A, 11K/01D	Dominion Steel and Coal Company
PR ME 1952-1	11E/10A, 11K/01D	Intercolonial Coal Company
PR ME 1970-1	11F/15A	Kaiser Celestite Mining Limited
PR ME 1975-2	11K/08A	Cape Breton Development Corporation
PR ME 1976-1	11J/04C	Cape Breton Development Corporation
PR ME 1979-1	11J/04C	Cape Breton Development Corporation
PR ME 1980-6	11J/04C	Cape Breton Development Corporation
PR ME 1982-7	11J/04C	Cape Breton Development Corporation
PR ME 1984-4	11J/04C	Cape Breton Development Corporation
PR ME 1985-11	11D/12D, 13D	Seabright Resources Incorporated

Susan Saunders and Jeff Poole

Elk Explorations Ltd.: Mine Development on a Shoestring; but How Big is a Shoestring?

Editor's Note: The Golden Eagle Mine was part of the Mill Village Gold District and began operations in 1899, 13 years after gold was discovered at Mill Village, Queens County. Lindsay Allen acquired the claim block after completing a DNR-sponsored prospecting course and has been working on the property for many years. Lindsay's goal is to bring parts of the former mine back into production. One of his main interests is to make the regulations affecting small scale mining operations appropriate to their size.



Lindsay Allen (L) and Ken Hiltz (R) stand at the entrance to the Golden Eagle Mine.

For the last 135 years prospectors have been looking in the Mill Village area for a 16 inch vein bearing up to 10 oz. Au/ton that has eluded them. In 2001 Elk Explorations Ltd. de-watered and inspected the Golden Eagle Mine. We excavated a working area around the shaft and refurbished the crib work, removing about 4 ft. of the upper, rotten crib work. The lower portion of the crib, which was submerged, was found to be in excellent condition. We carried out preliminary pumping to ascertain the condition of the crib work and the amount of debris in the shaft. Logs were laid across the mine opening and covered with corrugated metal sheeting while excavating, to minimize additional debris falling in.

There are strict rules and regulations to be complied with, and many permits to be obtained when doing this work, which must be carried out under the guidance of a mining engineer. Specialized equipment is also required. Old mine sites can be very dangerous.

After air quality was checked and found to be good, and the shaft opening was deemed safe, the debris was removed. This consisted of about 10 tons of rock, sand and gravel sitting on the top landing. Pump tests were run to establish de-watering rate, water inflow, and probable stope sizes. About every 10-15 ft. (3-5 m) of de-watering, an inspection was made to determine water inflow from cracks and joints, and the general condition of the foot wall, hanging wall, pit props (stulls) and landings.

The mine was found to be in excellent condition, with a sound, competent crown pillar, smooth quartzite hanging wall and foot wall, and secure, competent timbers. Most of the mine workings were in excellent shape from being submerged for the last 100 years. There was no debris under the top landing, and water inflow was found to be minimal. The bottom of the stope was reached at a depth of 80 ft.

To the east of the shaft the ore is still in place, to the west it has been stoped. New ladders were built and installed to the bottom of the stope. New props and landings were installed to enable us to examine the remaining vein package and take samples. Lockable mine shaft doors were fitted.

The gold-bearing belt of slate and quartz was found to be 3-5 ft. thick, with quartz constituting 20-30% of that belt. There is a main 8 inch vein and several 1-2 inch veins on either side, with many quartz veinlets and stringers. The gold was found to be mostly fine (>75 microns) flakes, smears and dust, with some larger pieces to 1-2 mm. The mine was noted for its rich pockets of gold and it is hoped some may be discovered during mining.

In 2002, the company has continued work at the Golden Eagle Mine by: (1) building a mill that will handle about 10 tons of ore per day; (2) working on a minimum hoisting specification for removing ore; and (3) surface prospecting in the vicinity of the mine.

So the question you may be asking is: "How big is Elk Exploration's shoestring budget?" Rough figures are $35,000 for purchase and rental of equipment, $4,000 for excavation and road construction, $10,000 operating expenses, $5,000 for a consulting engineer, and if you were to factor in free labour and time, perhaps another $30,000.

All this work is being carefully documented to develop a "Code of Practice for Small Mines". Hopefully this code will help set the standards for anyone else contemplating such a venture.

Lindsay Allen (Elk Explorations Ltd.)

Mining Matters 2002
Field Trip, Friday, November 15

Exploring Geoscience, Land-use Planning, and Mineral Development in the Halifax Regional Municipality

Purpose

This field trip explores how geoscientists apply their knowledge for resource extraction, reclamation and rehabilitation, and land-use planning. Specifically the purpose of the field trip is to:

- illustrate the application of geoscience knowledge in urban, suburban and rural settings;
- visit locations that show (1) mineral resource extraction and reclamation and (2) the application of geoscience to land-use planning; and
- demonstrate the value of geoscience knowledge and its application.

Locations

The stops have been carefully chosen to support the purpose of the field trip. Participants will visit landfill sites, an aggregate operation, reclaimed mine sites, acid rock drainage sites, business development parks and a gypsum mine.

Who Should Attend

Everyone with an interest in geoscience will find this field trip beneficial. Those involved in land-use planning at municipal and provincial levels will see many examples of geoscience applied to planning. Municipal and provincial politicians will find this field trip helpful in understanding the process of mineral development and land-use planning.

Leaders

Fred Bonner and Howard Donohoe, DNR, Mineral Resources Branch

Arrangements

- Friday, November 15, 2002: rain (snow) or shine - be prepared!
- Leave 08:00 (return 17:00) from the front of the Maritime Museum of the Atlantic, Lower Water Street, Halifax
- Travel by bus
- Lunches provided
- Cost: $10.00, payable at the registration desk for Mining Matters 2002, Westin Nova Scotian Hotel, November 13 or 14

Spaces are limited, so book now by contacting Fred Bonner (902-424-8140), Howard Donohoe (902-424-7199), or by using the on-line registration on our web site: http://www.gov.ns.ca/natr/meb/oh/oh26fiel.htm. You may also register for the field trip by filling in the pre-registration form on the brochure that will be mailed with this issue of the newsletter.

Dates to Remember

October 30 - November 2, 2002
Annual Review of Activities, Geological Survey of Newfoundland and Labrador, and CIM Newfoundland Branch Annual Meeting, Delta Hotel, St. John's, Newfoundland. For more information contact Norm Mercer (phone 709-729-6193, e-mail nlm@zeppo.geosurv.gov.nf.ca) or visit the web site http://www.geosurv.gov.nf.ca.

November 6-8, 2002
Annual Review of Activities, Minerals and Energy Division, New Brunswick Department of Natural Resources and Energy, Sheraton Inn, Fredericton, New Brunswick. For more information contact Don Carroll (phone 506-453-6624, e-mail don.carroll@gnb.ca) or visit the web site http://www.gnb.ca/0078/minerals/review.htm/.

November 13 and 14, 2002
Mining Matters for Nova Scotia 2002: Opportunities for Economic Development, Westin, Nova Scotian Hotel, Halifax. For more information contact Mike MacDonald (phone 902-424-2523, e-mail mamacdon@gov.ns.ca), or visit the web site http://www.gov.ns.ca/natr/meb. Please see the article on page 1 and Program on pages 4 and 5.

January 27-30, 2003
British Columbia and Yukon Chamber of Mines, Cordilleran Roundup, The Westin Bayshore Resort and Marina, Vancouver, British Columbia. For more information contact Sally Howson (604-689-5271, ext. 104) or visit the web site http://www.bc-mining-house.com/.

March 9-12, 2003
Prospectors and Developers Association of Canada, International Trade Show, Metro Toronto Convention Centre, Toronto, Ontario. For more information contact the PDAC (phone 416-362-1969, fax 416-362-0101) or visit the web site info@pdac.ca.